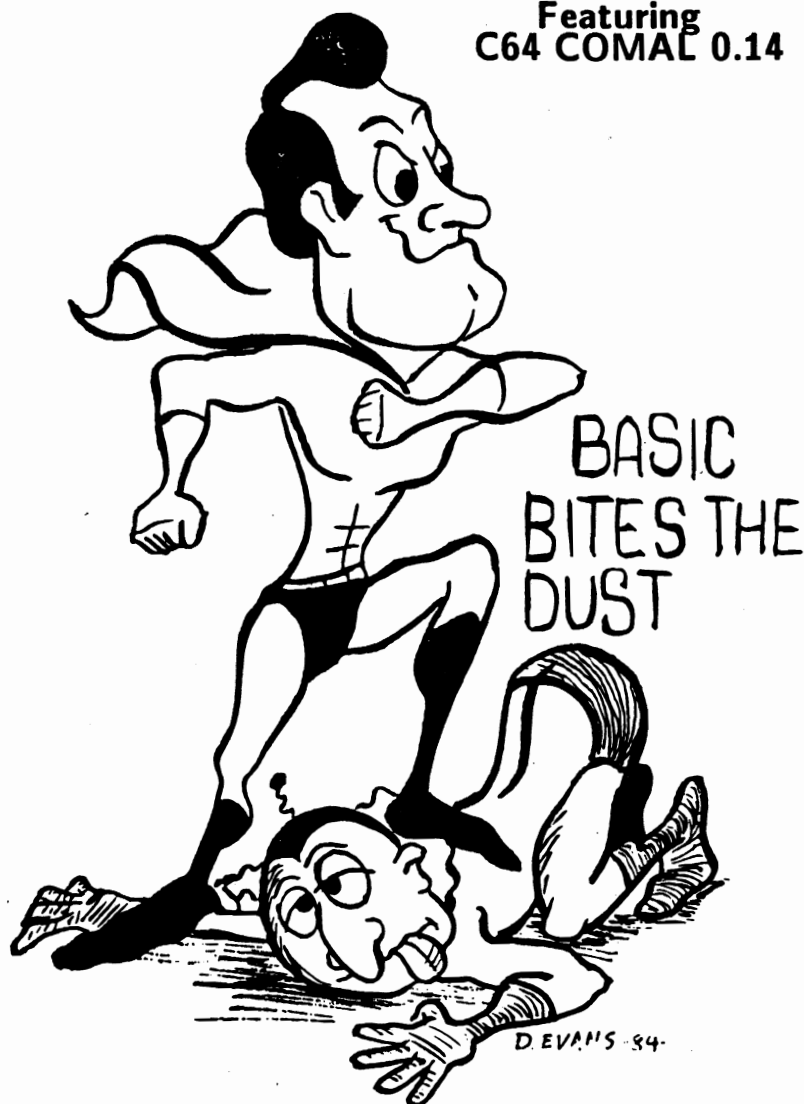


# *The Amazing Adventures of* **CAPTAIN COMAL™**

Featuring  
**C64 COMAL 0.14**



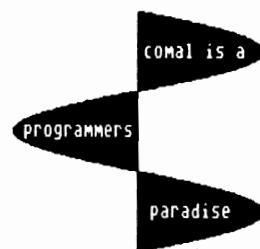
**COMAL is the winner! See page 11.**

**INSIDE: 4 ready to type programs:**

**Graphics Designer  
Electronic Phonebook  
The Walker  
Ready, Aim, Draw**

Artwork by: D. Evans and Wayne Schmidt

Captain COMAL is registered trademark of COMAL Users Group USA Ltd.



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# How to Get Started

---

There is more than one way to start with COMAL. Here are some suggestions:

Get the *Programmers Paradise Package* and optional *Tutorial Disk* and get two extra disks free: *Best of COMAL* and *Auto Run Demo*. The package includes the reference book *COMAL From A To Z* and four back issues of *COMAL TODAY*. The complete COMAL 0.14 system is on each disk, so you may start with any of them. We even include a Fast Loader at no extra charge. This package is an unbelievable bargain: only \$24.95 plus \$2 shipping (subject to change - two disks may be supplied on one double sided diskette).

Once you have all this, the question becomes: "What do I do next?" First, read this whole information flyer. Next, backup the disks and store the originals in a safe place. A backup program is included on the *Programmers Paradise Disk* (see page 20 for instructions). Then, start up the *Auto Run Demo Disk*:

```
Turn computer system on.
Insert Auto Run Demo Disk.
Type:    load "boot*",8
         run
```

You will see 26 COMAL programs, one after another, all automatically. No need to even touch the keyboard. When you are ready to stop, press the STOP key to stop a running program. It will automatically return you to the main menu. Then press the STOP key again. You then will be in COMAL programming mode.

To see more COMAL programs, place the *Best Of COMAL* or *Programmers Paradise Disk* in the drive and type:

```
cat
```

If you see a program listed that you

would like to run, press the STOP key to stop the catalog. On a blank line type:

```
chain"name"
```

Of course, you will replace the name with the name of the program you want to see. Spell it right. Don't use the shift key with letters.

Use the STOP key to stop any program you try. Then you can do the same thing again with another program.

If you are interested in what a COMAL program looks like, STOP one of the programs, and issue the command:

```
list
```

COMAL displays the program for you. The CTRL key slows the listing down. Press the SPACE BAR to pause the listing. Press SPACE again to resume.

Once you have seen some COMAL programs in action, you should be ready for the 20 lesson tutorial. Place the *Tutorial Disk* into the drive and start it up:

```
FROM BASIC:
  load "boot*",8
  run
```

```
FROM COMAL:
  chain "menu"
```

Do the lessons in order beginning with lesson one. After each lesson is over, it will return you back to the menu.

Once you have seen COMAL programs, and have learned a little about COMAL from the tutorial system, find a comfortable chair and flip through the sample issues of *COMAL TODAY*. At 80 pages each, they are like small books. Skip the technical and advanced articles and concentrate on

More ►

**XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX**

the beginning information. You can read them again later for more advanced information. Finally, page through the book *COMAL From A To Z*. It is a mini reference to the COMAL keywords.

Now, explore on your own. Try changing some of the programs. It is easier at first to start with a working program and just make changes! ■

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## HOW TO TYPE IN COMAL PROGRAMS

Line numbers are irrelevant to a running COMAL program. COMAL only provides line numbers for your benefit in editing the program. Thus most magazines do not use line numbers when listing a COMAL program. It is up to YOU to provide the line numbers. But of course, COMAL can do it for you quite easily. Just follow these steps to type in a COMAL program:

- ```

1) Enter command: NEW
2) Enter command: AUTO
3) Type in the program
4) When done:
   Version 0.14: Hit <RETURN> key twice
   Version 2.0 : Hit <STOP> key

```

Remember - use unshifted letters throughout entering the program. If letters are capitalized in the listing it does not mean to use SHIFT with those letters. They are capitalized merely to be easy to read. The only place to use SHIFTED letters is inside quotes. Also, you don't have to type leading spaces in a line. They are listed only to show structures. You DO have to type a space between COMAL words in the program. ■

## FILENAME CONVENTIONS

To help you distinguish between the many types of disk files possible, we use the following filename conventions (COMAL 0.14 usually uses a suffix. COMAL 2.0 usually uses a prefix):

| <u>Suffixed</u> | <u>Prefixed</u> | <u>Meaning</u>       |
|-----------------|-----------------|----------------------|
| NAME            | NAME            | COMAL program file   |
| NAME.L          | LST.NAME        | ASCII program list   |
| NAME.PROC       | PROC.NAME       | PROC listed to disk  |
| NAME.FUNC       | FUNC.NAME       | FUNC listed to disk  |
| NAME.DAT        | DAT.NAME        | Data file            |
| NAME.TXT        | TXT.NAME        | Text file            |
| NAME.DOC        | DOC.NAME        | Documentation file   |
|                 | EXT.NAME        | External PROC/FUNC   |
|                 | SHAP.NAME       | Sprite shape file    |
|                 | FONT.NAME       | COMAL font file      |
|                 | FONT.MC.NAME    | Multicolor font file |
|                 | SET.NAME        | Basic type font file |
|                 | PKG.NAME        | Package file         |
|                 | BAT.NAME        | Batch file           |
|                 | SNG.NAME        | Song file            |
|                 | HRG.NAME        | Color COMAL picture  |
| NAME.HRG        |                 | Black/White bitmap   |
|                 | CRG.NAME        | Compacted color pix  |
| NAME.CRG        |                 | Compacted B/W bitmap |
| NAME.SRC        |                 | Assembler Source     |
| NAME.OBJ        |                 | Assembler Object     |
| NAME.PPC        |                 | PaperClip file       |

□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

## Programmers Paradise Features

When you get the *Programmers Paradise Package*, you get more than the best programming language. You also get demonstration programs to show you what COMAL can do. One of these programs is *CRG14.VIEWER*. This program lets you view compact pictures stored on disk (CRG is the filename suffix for compact picture files). Of course we also include some compact picture files for you to start with, including our own *CALVIN THE COMAL TURTLE* (he is smiling on the last page).

---

# How To Do It In COMAL

---

## **\*\* How to start C64 COMAL 0.14**

Put COMAL disk into drive then type:  
load "boot\*",8  
run

## **\*\* How to return to BASIC from COMAL**

Type the command:  
basic

## **\*\* How to see what is on a disk**

Put the disk into the drive. Type:  
cat

The CTRL key slows the display scroll.

## **\*\* How to retrieve a program from disk**

Put the disk into the drive. Find the program name exact spelling (see CAT above). Type the command (replace name with the name of the program you want):  
load "name"

## **\*\* How to run a program that is already in the computer**

Issue the command:  
run

## **\*\* How to run a program from disk**

Put the disk into the drive. Find the exact program name (see CAT above). Type the command (replace name with the name of the program you want to run):  
chain "name"

## **\*\* How to stop a running program**

Press the STOP key. If that doesn't work, press the RESTORE key and STOP key simultaneously (resets COMAL).

## **\*\* How to look at a program**

If the program is not in the computer yet, first LOAD the program:  
load "name"

To see the program in the computer type:  
list

The CTRL key slows down the display. To pause it, press the SPACE BAR. Press SPACE again to resume. See page 38 of *COMAL From A To Z* for more information.

## **\*\* How to write a new program**

Issue the commands:  
new  
auto

Now, type in the program. Hit RETURN key twice in a row to stop the AUTO mode. See page 3 for more information.

## **\*\* How to erase lines in a program**

Find the line number of the line to be erased (line 100 in this example), then issue a DEL command:  
del 100

You may delete a block of lines all at once. Find the first and last line numbers in the block of lines (lines 500 thru 750 for this example), then issue a DEL command:  
del 500-750

See page 20 of *COMAL From A To Z* for more info.

## **\*\* How to add lines to the end of a program**

The program must be in the computer. Find the last line number currently used

More ►

**How To Do It In COMAL - continued**

(630 for this example). Then issue the command:

```
auto 640
```

Specify a starting line that is 10 more than the last line in the program.

## **\*\* How to add lines in the middle of a program**

The program must be in the computer.  
Locate the place you wish to add a line.  
For example, between the following:

```
0040 PRINT "WELCOME TO MY PROGRAM"
0050 PRINT "HOPE YOU ENJOY IT"
```

Type in the line to add, using a line number between the two lines.

0045 PRINT "WRITTEN ON DECEMBER 25, 1985

Numbering a program by 10's allows you to easily add up to 9 lines between any current lines.

## **\*\* How to renumber a program**

If you add or delete lines in a program, it is easy to restore the program to be numbered by 10's. Issue the command:

```
renum
```

See page 51 of *COMAL From A To Z* for more information about RENUM.

## **\*\* How to store a program on disk**

Type the command (replace name with the name that you wish to store the program as):

```
save "name"
```

## **\*\* How to list a program on the printer**

Make sure the program is in the

```
computer. Issue the commands:
  select "lp:"
  list
```

## **\*\* How to set printer auto linefeeds**

```
linefeed+    turns linefeeds on
linefeed-    turns linefeeds off
```

**\*\* How to access the device and secondary address**

```
Send all output to printer device 4,  
secondary address 7 (lower case mode):  
    open file 255,"lp:",unit 4,7,write  
    select "lp:"
```

```
Send output to device 5 printer:
  open file 255,"lp:",unit 5,write
  select "lp:"
```

Access to disk drive device 9 rather than default device 8 by adding a ",9" at the end of many commands:

```
save "name",9
load "name",9
chain "name",9
open file 2,"name",unit 9,read
```

## **\*\* How to flip text and graphics screens**

Initialize the graphics screen the first time (choose type of screen 0 or 1):

```
setgraphic 0 // <-- hi res
setgraphic 1 // <-- multi-color
```

Once the screen is chosen, you can flip between graphics and text easily with the function keys:

```
f1 - flips to the text screen
f3 - flips to the graphics screen
      with text window at top
      (called split screen)
f5 - flips to the graphics screen
```

---

# Just For Beginners

---

When you are just starting with computers, things seem very confusing. It becomes easy once you understand what is going on. Remember, you are not alone. All of us were beginners once.

## TO LOAD or NOT TO LOAD

There is one important thing to remember: you can't load everything on the disk. Some things on the disk are not meant to be loaded. They are there for other reasons. The clue that a file on the disk is not meant to be loaded is the dot (.) in its name. We often refer to these nonloading files as **DATA FILES**. See the chart of file name conventions on page 3 for examples.

Look at the directory of our disks. We try to clearly separate the files that are programs (the ones you can LOAD and RUN) from the files that are not. For example, a partial directory from our *Auto Run Demo Disk* follows:

### AUTO RUN DEMO

```
"boot c64 comal"
"c64 comal 0.14"
"comalerrors"
"hi"
">---programs---<"
"menu"
"Arabesque"
...
"Towers of Hanoi"
"-----"
"> data files <"
"> follow <"
">-----<"
"abc.sprite"
"calculator.hrg"
"glady.hrg"
```

The first files at the top of the directory are the COMAL System. The

first is a basic program that is used to start COMAL. The second is the COMAL 0.14 system itself. The third is the error messages used by the COMAL System. Finally, HI is the COMAL program that runs automatically when COMAL starts up. Immediately after them notice the line:

```
">---programs---<"
```

That line tells you that the programs come next. Program files are the ones that you can LOAD and RUN like this:

```
load "menu"
run
```

Or you may use one command that is the equivalent of both LOAD and RUN at once:

```
chain "menu"
```

You can see the COMALERRORS file is before the >---programs---< banner. It is separated purposely so you will not try to LOAD it. The COMAL system gets its error messages from this file. Thus, error messages could be in Spanish, French, or any other language, if an appropriate error message file were created and named COMALERRORS.

Finally, the files at the end of the directory are preceded by the banner:

```
"-----"
"> data files <"
"> follow <"
">-----<"
```

Remember, data files are NOT programs. Do not try to LOAD them. We group them together so that we may clearly mark them as data files. CALCULATOR.HRG is among them. It is a picture file. Read the disk directory carefully and you won't have problems trying to LOAD a file that is not meant to be loaded.

More ►

**MAKE A BACKUP COPY - IT IS IMPORTANT**

"How do I make a backup copy?", you ask. The answer is so important that we've included a program on the *Programmers Paradise* Disk that will backup a disk for you. See page 20 for instructions.

## MAKE YOUR OWN COMAL STARTUP DISK

Many users wish to create a special disk that they can use to start up COMAL. It would include COMAL, the error message file, the *SIZZLE* fast loader, and the HI program. To create your own COMAL disk, get a blank disk and put it into the drive. Issue the format command:

**From BASIC:**

```
OPEN 15,8,15,"N0:DISKNAME,ID"
CLOSE 15
```

**From COMAL:**

PASS "NO:DISKNAME.ID"

Using the Single File Copier program (instructions on page 22) copy these COMAL system files onto the new disk:

```
boot c64 comal
c64 comal 0.14
hi
ml.sizzle
comalerrors
```

The first program is a BASIC program that starts up COMAL for you. Make sure you use the files from the *Programmers Paradise Disk* since they include a fastloader (the COMAL 0.14 system itself has not changed since November 1983 when it was released). Make sure that the boot program is the first one on the new disk. Then you can start COMAL with:


```
load "*",8
run
```

It is easy to customize the system so that it automatically runs any COMAL program you want! When COMAL starts, the first thing it does is LOAD and RUN the program named HI from the disk. You can change the HI program to any COMAL program you like. Just name the program you want to automatically start HI. Or, if you wish to keep your programs with their original names, just make a HI program that is merely one line long:

```
0010 chain "start"
```

Replace "start" with the name of your program you want to be run first. Save this one line program as "hi":

```
delete "0:hi"  
save "0:hi"
```

Now when COMAL starts up, it will load and run your HI program. Then the HI program will load and run the program with the name you chose! Automatically! 

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## Programmers Paradise Features

There are over 40 different disks of COMAL programs available. We were surprised that our *FONT DISK* became one of the most popular. A "font" is the definition of how each character is displayed on your screen. For example, our "headline" uses Helvetica font. Our address at the bottom of this page uses Roman Times font. The *VIEW'FONT/DEMO* program on the *Programmers Paradise Disk* allows you to change the font used by COMAL to display characters on your screen. Of course we provide several alternate font files on the disk as well. If you like it, we have dozens of other fonts available on the *FONT DISK*, as well as a *FONT EDITOR* for COMAL 2.0 that let's you design your own font. ■

---

# What Is COMAL?

---

*COMAL has an identity crisis. It is ideal for beginners and non-professional programmers. But it is so powerful that professional programmers love to use it. And with over 3,000 ready to run COMAL programs available, many use COMAL just for the LOAD and GO programs.*

Commodore has just announced that COMAL is the third most popular language used on its computers. With over 100,000 COMAL users, that is to be expected. BASIC and machine code were more popular only because they come with the computer. OK, but what exactly is COMAL?

## COMAL IS SIMPLY THE BEST.

COMAL is a sophisticated computer programming language that is powerful, yet easy and fun to use. With COMAL you can write your own programs, complete with sprites and graphics.

## WHO CAN USE COMAL?

YOU can! COMAL is available to run on many popular computers, including COMMODORE 64, IBM PC, MS-DOS, Commodore 128, Commodore PET, CP/M, and soon Apple IIe, Apple IIc, MacIntosh, and Amiga.

## IS IT EXPENSIVE?

If you have a Commodore 64 with disk drive, the cost is minimal. For only \$19.95 (subject to change) you get the *Programmers Paradise Package*. This includes the complete disk loaded C64 COMAL 0.14, the *COMAL From A to Z* reference manual, a collection of several *COMAL TODAY* newsletters and a disk full of demonstration programs. For only \$5 more you get a double sided disk which includes the interactive *Tutorial System Disk* and more demonstration

programs called the *Auto Run Demo Disk*. Get it now and we include the *Best Of COMAL* disk as well!

If you want only the best, a deluxe version of COMAL is available as a cartridge for the Commodore 64. It has more memory space, more power, and more options. A powerful version for the IBM PC and MS-DOS computers is also available. Since these are imported, their price may fluctuate.

## COMAL IS NOT COPY-PROTECTED!

The disk loaded COMAL for the Commodore 64 may be freely copied. We give you permission! We want everyone to know and love COMAL as much as we do.

## WHY COMAL WILL REPLACE BASIC

### \*\*\* COMAL is FASTER

In 11 Benchmark tests between COMAL and BASIC, COMAL was faster in every test. It was 3 times faster overall, and an amazing 57 times faster in string searches. IBM PC COMAL is even faster than Turbo Pascal (BYTE benchmark).

### \*\*\* COMAL is STANDARDIZED

A standard for COMAL exists called the COMAL KERNAL. Thus as new COMAL systems appear, they'll be virtually compatible. Programs you write today, you can run tomorrow on other COMAL computers. For example, we use a large COMAL program to process orders here. It was written for Commodore 8096 COMAL 2.0. We transferred it via modem to IBM PC COMAL 2.0 and it ran after only modifying the file names and one substring shortcut that IBM PC COMAL does not allow!

More ►



What Is COMAL? - continued

\*\*\* COMAL is HELPFUL

COMAL checks each line of your program as you enter it! You are informed, with *understandable* error messages, whenever you type in an incorrect program line. COMAL also checks over your entire program before it does a RUN. This takes less than a second and informs you of an error before the program actually starts running. This is essential to good program testing and is a feature sadly lacking in BASIC. Error messages are automatically removed from the screen when you correct the error.

\*\*\* COMAL is LITERATE

COMAL lets you use long variable names and named procedures. To keep a running total, no need to call the variable T. Call it TOTAL. And to use a pause subroutine in BASIC you might have to code:

```
XP=4:GOSUB21500
```

In COMAL you would simply write:

```
PAUSE(4)
```

\*\*\* COMAL HAS A GOOD MEMORY

Once you have written a procedure, you can call it by name from direct mode. Just like adding your own keywords!

\*\*\* COMAL IS WELL DOCUMENTED

The *COMAL Handbook* (479 pages) documents COMAL in an easy to use style. Excellent tutorial books are also available. Over 16 different COMAL books in all.

\*\*\* COMAL includes easy GRAPHICS

C64 COMAL includes the *TURTLE* graphics system as popularized by LOGO. You no

longer have to purchase LOGO to enjoy this highly acclaimed drawing system.

\*\*\* COMAL is OFFICIAL

COMAL is the official language in Denmark, Ireland, Sweden, Scotland and Norway. Since it is so easy to learn, it is ideal for schools.

\*\*\* COMAL is STRUCTURED

Structured programming merely means *simplified* programming. COMAL includes the program structures that made Pascal popular. You no longer have to put up with Pascal's limitations and rigorous rules to enjoy structured programs.

\*\*\* COMAL includes BASIC keywords

You can continue using most of the BASIC language you may already know, in an improved environment.

\*\*\* COMAL has COLOR GRAPHICS

C64 COMAL includes nearly 50 keywords for graphics control.

\*\*\* COMAL has SPRITES

C64 COMAL includes keywords for controlling sprites. No more PEEK and POKE to create enjoyable games and educational programs. The cartridge version has twice as many commands, including easy sprite animation!

\*\*\* COMAL uses the FUNCTION KEYS

C64 COMAL utilizes the function keys for easy access to the graphics screen, text screen, or split screen. Flip back and forth between screens with the touch of one key. The C64 COMAL 2.0 Cartridge and

More ►

[illegible]

IBM PC COMAL even allow you to redefine the function keys yourself.

**\*\*\* Program listings - EASY TO READ**

COMAL automatically indents all structure blocks, making program listings very easy to read.

\*\*\* COMAL is easy to MAINTAIN

Since COMAL allows modular programming, complete with multi-line procedures and functions, it is easy to maintain a COMAL program. And in serious programming, program maintenance is usually more time consuming than the original programming time.

\*\*\* NOT SLOWED DOWN by remarks

Many magazine articles recommend that you remove REMARK statements from a finished BASIC program to speed up its execution. This BAD programming practice is totally unnecessary in COMAL.

### \*\*\* LONG VARIABLE NAMES

A long variable name takes up no more program space than a short variable name. COMAL stores your program efficiently. You are not penalized for creating a readable program.

\*\*\* MERGE program segments together

A built in feature allows you to merge a program segment from disk with the program currently in memory.

### \*\*\* Read BASIC disk data files

COMAL can read and write files in two ways: efficiently in BINARY or the BASIC way in ASCII. Thus you can convert BASIC

programs into COMAL and continue using the same data files, both sequential and random access.

\*\*\* COMAL is POWERFUL

COMAL is already used in Denmark to control several airports. It is also used in industrial controllers and with special instruments in laboratories. Computer Aided Learning systems are already running in both Canada and Denmark, written in COMAL. Several Data Bases are available in COMAL. Accounting Packages, Spreadsheets, and other applications are currently being written in COMAL.

**\*\*\* CONSISTENT and WELL DESIGNED**

COMAL benefits from over 10 years of developement. It is not a series of "patches" to BASIC, but a well researched and designed language. COMAL is what BASIC should have been.

**\*\*\* COMAL IS AVAILABLE NOW**

COMAL is not a dream. It is a finished product. There are over 100,000 COMAL users already. You should be next.

### \*\*\* HOW TO GET STARTED

We put together especially for C64 beginners, the *Programmers Paradise Package* (\$19.95). Make sure to get the optional *Tutorial Disk* for \$5 since we then also give you the *Best Of COMAL* and *Auto Run Demo* disks as well. If you want only the BEST, order the C64 Deluxe COMAL 2.0 Cartridge Package. Remember to add on shipping costs (\$2 minimum) and use our order form to avoid confusion. ■

# Dare To Compare

If you take just a moment to compare programming languages, you will see why COMAL is the number 1 language of choice. BASIC and Machine Language are more popular - but that is because they come with the computer. A quick glance at the comparison chart below should convince you - COMAL 0.14 is preferable over BASIC, and the COMAL 2.0 Cartridge is even better, perhaps the BEST bar none!

Looking at the chart below, you might wonder why so many people still use BASIC when it doesn't have many extra features. You are invited to join over 100,000 COMAL users. Choose the language that will be the next standard. Choose COMAL. The *Programmers Paradise Package* makes starting easy. Call today. We can quickly send you the package. ■

## Comparison Chart

| COMAL 2.0<br>COMAL 0.14<br>BASIC 2.0    | x = included<br>- = not included | COMAL 2.0<br>COMAL 0.14<br>BASIC 2.0    | x = included<br>- = not included | COMAL 2.0<br>COMAL 0.14<br>BASIC 2.0    | x = included<br>- = not included |
|-----------------------------------------|----------------------------------|-----------------------------------------|----------------------------------|-----------------------------------------|----------------------------------|
| <b>=EDITING=====</b>                    |                                  | <b>=INPUT-OUTPUT-PRINTER==</b>          |                                  | <b>=GRAPHICS=====</b>                   |                                  |
| x x - AUTO - automatic line numbers     |                                  | x x - TAB works on printer as on screen |                                  | x x - Turtle graphics and X/Y graphics  |                                  |
| x x - RENUM - renumber lines            |                                  | x x - Variable size print zones         |                                  | x x - Hi-res or multicolor graphics     |                                  |
| x x - MERGE from disk                   |                                  | x x - Print zone-same on printer/screen |                                  | x x - Split screen (text/graphics)      |                                  |
| x x - Syntax checking on entry          |                                  | x x - Set up default printer types      |                                  | x x - Background/Border color keywords  |                                  |
| x x - Delete blocks of lines            |                                  | x x - Built in graphic screen dump      |                                  | x x - Mix text and graphics on screen   |                                  |
| x - - FIND and CHANGE commands          |                                  | x x - Built in text screen dump         |                                  | x - - Graphics text in any size         |                                  |
| x x - Pause a program listing           |                                  | x x - PRINT USING formatted output      |                                  | x - - Graphics text sideways            |                                  |
| x - - TRACE- for debugging your program |                                  | x x - Select output: printer or screen  |                                  | x - - Save a graphics screen to disk    |                                  |
| x - - 'Quote mode' disable / enable     |                                  | x - - Select input: keyboard/batch file |                                  | x - - Window capabilities               |                                  |
| x - - Understands UPPER and lower case  |                                  | x - - INPUT AT and PRINT AT             |                                  | x x - Line clipping within frame        |                                  |
| x - - Erase to end of line - CONTROL K  |                                  | x - - Automatic protected input fields  |                                  | x x - ARC and CIRCLE commands           |                                  |
| x - - Ooops key - CONTROL A             |                                  | x x - Allows null reply to input        |                                  | x x - FILL command                      |                                  |
| <b>==FILES=====</b>                     |                                  | x x - Allows STOP key during input      |                                  | x x - PLOT a point                      |                                  |
| x x - Binary sequential/random files    |                                  | x x - Allows comma as part of input     |                                  | <b>==SOUND=====</b>                     |                                  |
| x x x ASCII sequential/random files     |                                  | x - - User definable character fonts    |                                  | x - - BELL command                      |                                  |
| x x - Easy one command random file use  |                                  | <b>==STRUCTURES=====</b>                |                                  | x - - Built in sound commands           |                                  |
| x x - GET from disk                     |                                  | x x x FOR loop                          |                                  | x - - Control sound envelope            |                                  |
| x - - Built in true ASCII conversion    |                                  | x x - Integer FOR loop                  |                                  | x - - Interrupt driven music built in   |                                  |
| <b>==DISK COMMANDS=====</b>             |                                  | x x - REPEAT...UNTIL loop               |                                  | <b>==MACHINE LANGUAGE=====</b>          |                                  |
| x x - CAT - catalog of files on disk    |                                  | x x - WHILE...ENDWHILE loop             |                                  | x x x Call machine code routines        |                                  |
| x - - Pause catalog-send it to printer  |                                  | x - - LOOP...EXIT loop                  |                                  | x - - Call machine code by name         |                                  |
| x x - STATUS - status of the disk drive |                                  | x x - CASE structure                    |                                  | x - - Link machine code to programs     |                                  |
| x x - COPY - copy files command         |                                  | x x - IF THEN ELSE - multiple lines     |                                  | x - - M/L routines parameter passing    |                                  |
| x x - DELETE - scratch files from disk  |                                  | x x - Call routines by name             |                                  | <b>==OTHER=====</b>                     |                                  |
| x x - MOUNT - initialize a disk         |                                  | x - - External procedures and functions |                                  | x - - Modem communications built in     |                                  |
| x x - RENAME a disk file                |                                  | x x - Multiple line procedure/function  |                                  | x x - Function keys defined             |                                  |
| x x - Knows when End Of File is reached |                                  | x x - Parameters with proc / func       |                                  | x - - Function keys alterable by user   |                                  |
| x x - CHAIN one program to another      |                                  | x x - LOCAL or GLOBAL variables         |                                  | x x - Stop key disable / enable         |                                  |
| <b>==NUMBERS=====</b>                   |                                  | x - - ERROR HANDLER - trap errors       |                                  | x - - Cursor command                    |                                  |
| x - - Accepts Hex and Binary numbers    |                                  | x x - Automatic indenting of structures |                                  | x x - No "garbage collection"           |                                  |
| x - x Includes Logical AND and OR       |                                  | <b>==SPRITES=====</b>                   |                                  | x - - Joystick/paddle/lightpen keywords |                                  |
| x - - Includes Logical XOR              |                                  | x x - Keywords for defining sprites     |                                  | x x - Built in string search - IN       |                                  |
| x x x Includes Trig functions           |                                  | x x - Keywords for setting sprite color |                                  | x - - Store a text screen for later use |                                  |
| x x - Understands TRUE and FALSE        |                                  | x x - Keyword for moving sprites        |                                  | x x - Long variable names               |                                  |
| x x - DIV and MOD operators             |                                  | x x - Built in collision detection      |                                  | x - - Can sense SRQ interrupt           |                                  |
| x x - Arrays with any minimum index     |                                  | x - - STAMP a sprite image onto screen  |                                  | x x - Can change part of a string       |                                  |
| x x x Integer numbers                   |                                  | x - - Animate sprites, interrupt driven |                                  | x - - Built in clear screen command     |                                  |
| x x - Produce random integer in a range |                                  | x - - Attach sprite shapes to programs  |                                  | x x x PEEK, POKE, SYS, GOTO ■           |                                  |

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# Questions and Answers

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*QUESTION: What computers can run COMAL?*

ANSWER: Commodore 64, Commodore 128, PET, CBM 8032, CBM 8096, MS-DOS, and IBM PC computers. European distributors also have COMAL for CP/M, APPLE with CP/M card, ACORN Electron, BBC MICRO, Compis, Scandis, Supermax, Unix, RC Piccolo, RC Partner, and more. Plus several European computers have COMAL built in. We expect COMAL for the MacIntosh, Apple IIe, Apple IIc, Amiga, and Atari ST soon.

*QUESTION: Does the inexpensive C64 COMAL 0.14 include much?*

ANSWER: Don't let the price fool you. Comparing it to BASIC is like comparing a Model T to a Rolls Royce. C64 COMAL 0.14 is packed with built in features including: Program Structures with Automatic Indentation, Full Screen program editing, Merging program segments from disk, Automatic line numbering, Line renumbering, Program chaining, Multi line procedures and functions with parameter passing, Local variables, Stop key disable, End Of Data and End Of File system variables, Built in String Search, Immediate Syntax Checking, built in Run Time Compiler, and much more. It leaves about 12K free work space on the Commodore 64 (equals to about 18K of BASIC program work space). If that isn't enough, it also includes a LOGO compatible turtle graphics drawing system plus easy to manipulate sprites.

*QUESTION: Does the COMAL 2.0 Cartridge do more than the disk loaded COMAL?*

ANSWER: Yes, much more. It has over 30K free user memory, PRINT AT, CURSOR, LIST procedure, added disk commands, both upper and lower case letters accepted on program entry, GET\$, GLOBAL variables in a CLOSED procedure, INTERRUPT monitoring the IEEE interrupt line, STR\$, VAL, and

TIME. It even has features you would only expect with the largest computers including: external procedures and functions, a structured error handler, protected INPUT fields, user defined string functions, windows, a built in sprite animation system, sound controls, and FIND and CHANGE commands.

*QUESTION: What about IBM PC COMAL?*

ANSWER: IBM PC COMAL produced by IBM Denmark is written by UniComal, the same people who brought us C64 COMAL. The IBM version is a much more serious and more powerful version. Although the system is in English, the manual is in Danish. We are patiently waiting for the English manual package before promoting it much in the United States. But we do use it extensively ourselves. Our order processing system runs under IBM PC COMAL, as does our accounting and inventory control systems. Anyone familiar with COMAL 2.0 on the Commodore 64 will have no problem using the IBM version. Even the full screen editing is alike! The price fluctuates since we import it from Denmark. Call to verify the current price.

*QUESTION: Do you put out a newsletter? Do you have memberships to your group?*

ANSWER: Our COMAL TODAY newsletter is the source of up to date information about COMAL. Contributions come from leading COMAL experts as well as users world-wide. Membership is not currently available, but a subscription to COMAL TODAY is virtually the same thing.

*QUESTION: Are your disks copy protected?*

ANSWER: Absolutely NOT! Unlike other languages, our C64 disks are not copy protected. You may make as many backup copies as you like. If you market programs written in C64 COMAL 0.14, you

More ►

Questions and Answers - continued

can include the COMAL system on the disk with your programs without any royalty payments.

*QUESTION: Can COMAL communicate via modem?*

*ANSWER: YES! Several COMAL Terminal programs are available on our Modem Disk. The COMAL 2.0 Cartridge has telecommunication capability built in.*

*QUESTION: Is a COMAL compiler available?*

*ANSWER: All versions include a Run Time Compiler, with many of the advantages. A true compiler is not yet available. However, IBM PC COMAL is faster than Turbo Pascal just as it is now!*

*QUESTION: Is COMAL faster than BASIC?*

*ANSWER: Much faster in all respects! A program will run about 3 times faster than an equivalent BASIC program. Write your program 3 to 10 times faster and fix any errors 3 to 10 times faster as well. String searches are actually over 50 times faster with COMAL. You do not sacrifice speed to gain COMAL advantages.*

*QUESTION: How about sound control?*

*ANSWER: Sound control commands are built into the COMAL Cartridge. COMAL TODAY has published routines for use with COMAL 0.14 (on TODAY DISK #8).*

*QUESTION: Do you recommend that students start with COMAL and progress to LOGO or BASIC?*

*ANSWER: Yes! By all means start with COMAL. But NO! LOGO and BASIC are not needed once you are using COMAL. BASIC is a step backwards and will only give students bad habits to UNlearn later. And COMAL includes virtually all of BASIC, without its hassles. LOGO is usually chosen for its Turtle Graphics -*

and these are included in both C64 COMAL and IBM PC COMAL. COMAL is the natural first language to learn. In fact, it is the first language taught in Ireland, Sweden, Norway, Scotland and Denmark.

*QUESTION: How about sample programs?*

*ANSWER: Over 3000 programs are available on more than 40 different disks.*

*QUESTION: Can a BASIC or LOGO program run under COMAL?*

*ANSWER: NO. However, it can be rewritten to do so. Likewise, BASIC and LOGO cannot run a COMAL program.*

*QUESTION: Is COMAL Commodore Approved?*

*ANSWER: Yes! It is approved by Commodore England. Commodore Canada introduced it at the World of Commodore Show, giving away over 500 COMAL disks in two days. The COMAL Handbook is approved by Commodore USA. And the COMAL Cartridge is manufactured by Commodore Denmark. COMAL is official. It also has been awarded the United States Commodore Users Group Endorsement (one step higher than Approval). Official distributor in the USA is COMAL Users Group USA Limited. IBM PC COMAL is also official, produced by IBM Denmark.*

*QUESTION: Will a standard COMAL program I write on my Commodore 64 run with IBM COMAL?*

*ANSWER: Yes. We use a system of COMAL programs to process orders here. They were written on a Commodore but now are running on an IBM PC compatible with 20 Meg Hard disk. We only had to change the file names and remove one short cut in substrings that Commodore allows but IBM does not. ■*

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# Letters

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## SOME OF OUR TYPICAL LETTERS:

- \* From a Commodore 64 publication: C64 COMAL 0.14 might be the product of the year. In my opinion, it is superior to Simons' Basic for graphics!
- \* As a longtime programmer in BASIC, Assembly, and other languages, I am speechless. COMAL 0.14 does indeed make BASIC obsolete...it is the clearest language I have ever used. J.S. Illinois
- \* Being a college senior in Computer Science, I have been exposed to many fine programming languages, including C, Ada, and Pascal... As a scientist, I am impressed with its control structures, readability, modularity, and maintainability. As a student, I am impressed with its price...B.P. Maryland
- \* ...it seems that COMAL is exactly what I have been waiting for. W.C. Delaware
- \* Turtle and Sprite commands all work in program and interactive modes and far exceed expectations. R.H. Montreal
- \* I am in love with COMAL. I have been using BASIC for around five years. It served its purpose but now it is time to move on to something better (now that it has arrived). R.J. Iowa
- \* I think COMAL is the best language available today! F.K.
- \* I have the 0.14 version on disk and am really astounded by its power. A.W.
- \* It is easy to understand your interest in COMAL. What an exciting language. The fact that so many features could be put in a home computer language is amazing to me. K.G. Utah
- \* I've been writing compilers and operating systems for NCR for a number of years and I'm totally amazed at COMAL. This is truly an exceptional language. L.F.
- \* I now own 'every' language that the Commodore 64 has... COMAL seems to be the best overall language by a long shot. R.G. Ohio
- \* I have just received my COMAL disk for the Commodore 64, version 0.14. I find this language absolutely fascinating. I teach computer programming for gifted children... M.B. Pennsylvania
- \* I've had second thoughts about my C64 in the past (its BASIC is the pits!), but with COMAL - no more. It is an unbeatable price/ performance combination. C.N. Ohio
- \* Nice language!! Sure has BASIC beat!! D.H. California
- \* I have been using COMAL since October 1983 on a C64 and I get more enthused about this language every time I use it. N.A. California
- \* After having played with COMAL on my C64 the past few days I can honestly say I am absolutely amazed! It really does seem easy to learn... C.G. Wisconsin
- \* I just received the COMAL 0.14 from you a week ago and it is great. I have used Pascal in my job and it appears that COMAL has some features Pascal does not. B.C. North Carolina
- \* As a language tyro [Forth, Logo, Pascal, Pilot, Fortran, Cobol] I can say that COMAL's the best language I've seen for micro's. D.V. Maryland ■

# COMAL Books

There are 16 COMAL books available now, and many more soon to be released. A category listing of the books is below. See COMAL TODAY #7 for full reviews.

## COMAL 0.14 & 2.0 Reference:

COMAL Handbook  
Len Lindsay

## COMAL 0.14 Reference:

COMAL From A To Z  
Borge Christensen

C64 Graphics With COMAL  
Len Lindsay

## COMAL 2.0 Reference:

COMAL 2.0 Packages  
Jesse Knight

Cartridge Graphics & Sound  
Captain COMAL's Friends

## General COMAL Tutorials

Beginning COMAL  
Borge Christensen

Foundations in Computer Studies  
With COMAL  
John Kelly

Structured Programming With COMAL  
Roy Atherton

Starting With COMAL  
Ingvar Gratte

## COMAL 0.14 Tutorials

COMAL Workbook  
Gordon Shigley

Graphics Primer  
Mindy Skelton

Captain COMAL Gets Organized  
Len Lindsay

## COMAL 2.0 Tutorials

COMAL 80 Tutorial Binder  
Frank Bason & Leo Hojsholt

## Other COMAL Books

Library of Functions & Procedures  
Kevin Quiggle

COMAL Yesterday  
Reprint of COMAL Today issues 1-4

COMAL Quick & Utilites Set 2  
Jesse Knight

## TOP 10 BEST SELLING COMAL BOOKS IN 1985

| 1985 | Book                        | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|------|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1    | *! COMAL From A To Z        | 2   | 2   | 3   | 5   | 4   | -   | 1   | 1   | 1   | 1   | 1   | 1   |
| 2    | ! COMAL Handbook            | 1   | 1   | 1   | 3   | 3   | 2   | 4   | -   | 5   | 4   | 5   | -   |
| 3    | *! Cartridge Graphics & Snd | 3   | 3   | 2   | 4   | 5   | 3   | 2   | 4   | 3   | 3   | 3   | 3   |
| 4    | @! Cartridge Tutorial Bindr | -   | -   | -   | -   | -   | 1   | 3   | 3   | 2   | 2   | 2   | 2   |
| 5    | @! Beginning COMAL          | -   | 4   | 1   | 1   | -   | 4   | 5   | -   | -   | 5   | -   | -   |
| 6    | *! COMAL Workbook           | -   | -   | -   | -   | 1   | 5   | -   | 2   | 4   | 5   | 4   | 5   |
| 7    | *! COMAL 2.0 Packages       | -   | -   | -   | 2   | 2   | -   | -   | -   | -   | -   | -   | -   |
| 8    | @! Foundations...with COMAL | 5   | -   | 4   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 9    | @! Structured...with COMAL  | 4   | 5   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 10   | ! COMAL Yesterday           | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | 4   |

\* means this book is a Captain COMAL series book  
@ means this book is imported



# Graphics Designer

by Captain COMAL

Who me? A designer? Now, an artist I'm not. But look at what I created (with a little help from COMAL). And it only took a few minutes to write the program that makes the design. Best of all, you can use the program as a starting point. *The hardest part of learning to program is starting!* I learned to program on my own years ago by looking at other peoples programs and then changing them.

Now, how would you draw a box? Draw a line and turn 90 degrees. Then do that 3 more times for all four sides:

```
SETGRAPHIC 0
FOR SIDES=1 TO 4
  FORWARD 20
  LEFT 90
ENDFOR
```

That will draw a box on your graphics screen (the first line puts you in graphics mode). Try it. Now, the fun part. Let's give those four lines we just wrote a name. Let's call them BOX. Just add a header line above them, and an ending line after them:

```
PROC BOX
.....
ENDPROC
```

Now, once your program is run, COMAL knows what you mean if you give the command BOX. But always drawing a size 20 box gets boring. Let's add a parameter! When we want a box, we will tell how big at the same time:

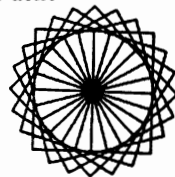
```
BOX(30)
```

Change your BOX procedure to look like it does in the program listing on the side. Now you can make boxes any size you want. The procedure DESIGN draws a series of BOXES at different angles.

Finally, I defined my own function named DONE. It shows how a function can include many lines, and even ask you questions (much different than the 1 line functions of BASIC).


- 1) Insert your COMAL disk in drive\*.
- 2) Type LOAD "C64 COMAL".8
- 3) Type RUN (starts COMAL)
- 4) Type AUTO (turn on auto line#s)
- 5) Enter the program lines shown below
- 6) Hit RETURN key twice when done
- 7) Type RUN

```
0010 // save "design" // in comal
0020 repeat
0030   design
0040 until done
0050 //
0060 proc design
0070   black:=0; white:=1
0080   background black
0090   pencolor white
0100   setgraphic 0 //high res screen
0110   //pick random number & size
0120   number'boxes:=rnd(6,36)
0130   box'size:=rnd(10,60)
0140   for boxes=1 to number'boxes do
0150     box(box'size)
0160     left (360 div number'boxes)
0170   endfor boxes
0180 endproc design
0190 //
0200 proc box(length)
0210   for sides:=1 to 4 do
0220     forward length
0230     left 90
0240   endfor sides
0250 endproc box
0260 //
0270 func done
0280   plottext 8,8,"do another?"
0290   while true do //forever
0300     case key$ of
0310       when "Y","y"
0320         return false
0330       when "N","n"
0340         return true
0350       otherwise
0360         border rnd(0,15) //flash
0370       endcase
0380     endwhile
0390 endfunc done
```



do another?

Notice how easy it is to make a design using the built in turtle graphics of COMAL. Line 220 draws a line and line 230 turns the turtle to prepare for the next line drawn. Setting the screen colors is equally easy as seen in lines 70-90. Random numbers can be produced within any range (lines 120 and 130). COMAL also understands TRUE and FALSE.

\* If you don't have COMAL yet, order a Programmer's Paradise Package-\$19.95. It includes the complete COMAL system plus over 400 pages of information. Add \$5 more to get our 20 interactive lesson Tutorial Disk. Add \$2 shipping. Visa/MC or US funds check accepted. 



# Electronic Phonebook

by Captain COMAL

I'm late! I better call George. Drat! What's his last name? Klaverston. No. Calverson? Wait! Why bother? You have a computer. COMAL is good at searching for things. This program does it all for you: creates the data file, let's you enter names into it, and best of all - finds a phone number when you need it. And you don't have to remember the persons full name either!

The find routine is simple. It is really done all in one line using IN (see line 440). The nice thing is that IN looks over the entire string for a match! To find the name George Galveston you could ask for George and it would match. Or ask for Galv, ston, or just G. They all will match.

And keeping track of your disk files with COMAL is easy too. The STATUS command reports on the status of the disk drive (see line 300). We use it to see if opening the file was OK ("00"). The first time you run the program the data file will not be there, and the program detects this and starts it for you. COMAL watches all your files for you. Whenever you reach the end of a file it sets EOF (for End Of File) to TRUE. By using EOF in line 420 we make sure our program is not upset if it can't find the person requested.

Did you see the ZONE command in line 10? In BASIC your screen is set up with a default zone width of 10, which is nice, if you happen to need that specific setting. In COMAL, you can set the zone to be any number you wish (0 is the default for none). Line 10 sets the zone to 21, perfect for use with names up to 20 characters long (which we set in line 20).

Finally, look at the multiple choice system COMAL has. Lines 90 through 190 show the CASE structure. KEY\$ looks at the keyboard and returns the key you just pressed (if any). It is the basis of our CASE. When the key is an E (upper or lower case) the ENTER'NAME routine is executed. When it is F the program first asks for a piece of information (what to look for) and then calls the routine FIND'NAME to do the search. If none of the WHEN cases match, COMAL provides us with the OTHERWISE section. All quite readable.

- 1) Insert your COMAL disk in drive\*.
- 2) Type LOAD "C64 COMAL",8
- 3) Type RUN (starts COMAL)
- 4) Type AUTO (turn on auto line#'s)
- 5) Enter the program lines shown below (COMAL indents lines for you)
- 6) Hit RETURN key twice when done
- 7) Type RUN


e=enter f=find l=list

f

What name? COMAL

COMAL Users Group 608-222-4432

```
0010 zone 21 // set auto tab to 21
0020 dim name$ of 20, phone$ of 12
0030 dim disk$ of 2
0040 black:=0; white:=1; yellow:=7
0050 background black
0060 repeat
0070   pencolor white
0080   print "e=enter f=find l=list"
0090   case key$ of
0100     when "e","E"
0110       enter'name
0120     when "f","F"
0130       input "What name?": name$
0140       find'name(name$)
0150     when "l","L"
0160       find'name("")
0170   otherwise
0180     print chr$(147) //clearscreen
0190   endcase
0200 until true=false //forever
0210 //
0220 proc enter'name
0230   input "Enter name : ": name$
0240   input "Enter phone: ": phone$
0250   if name$>" " then add'to'file
0260 endproc enter'name
0270 //
0280 proc add'to'file
0290   open file 2,"phone.dat",append
0300   disk$:=status$
0310   if disk$<>"00" then
0320     close // data file not found
0330     open file 2,"phone.dat",write
0340   endif
0350   write file 2: name$,phone$
0360   close
0370 endproc add'to'file
0380 //
0390 proc find'name(search$)
0400   pencolor yellow
0410   open file 2,"phone.dat",read
0420   while not eof(2) do
0430     read file 2: name$,phone$
0440     if search$ in name$ then
0450       print name$,phone$
0460     endif
0470   endwhile
0480   close
0490   print "Hit <return> when ready"
0500   while key$<>chr$(13) do null
0510 endproc find'name
```

\* If you don't have COMAL yet, order a Programmer's Paradise Package-\$19.95. It includes the complete COMAL system plus over 400 pages of information. Add \$5 more to get our 20 interactive lesson Tutorial Disk. Add \$2 shipping. Visa/MC or US funds check accepted. 

# Ready, Aim, Draw

by Captain COMAL

Oh no! Not another drawing program. Yes, dear readers. We are happy to present READY AIM DRAW. While the program doesn't come close to the commercial drawing programs or our own *GRAPHICS EDITOR* system scheduled for *COMAL TODAY* #11, it does show you how you can combine sprites and drawing on the graphics screen. It shows how even small programs can do this.

The program starts by setting up things (aptly named SETUP). You should get used to grouping parts of your program into small modules. Give each module a name (up to 78 characters long). From then on, whenever you want to execute the lines, just call them by name. Anyway, our program uses the SETUP module to set the screen colors, define the sprite, give directions, and ask what speed to use. To define the sprite shape it calls another module, DEFINE'SHAPE (see line 150).

We use the built in DEFINE command to define a sprite shape. That shape is setup by a 63 character string - plus a 64th character that tells whether or not it is high resolution. Our program uses DATA statements to provide the proper string characters. But notice, we don't have 63 numbers. We only use the numbers needed to set up the top corner of the sprite. That is all we need. The rest of the string is set to CHR\$(0) meaning blank. To do this we watch for the End Of Data (EOD). When EOD becomes TRUE, we know we have read the last number, and don't read any more (just continue using the last number read, which is 0).

COMAL understands what TRUE and FALSE mean. The program uses them in line 180 to set the sprite size to be expanded. Also line 40 uses them. The program continues to AIM until TRUE equals FALSE (which is never). To stop the program just hit the STOP key!

Meanwhile, the AIM module checks the keyboard. Press a cursor key and the small cross target is moved accordingly. Press the letter D to draw a line from the last point to the point you are currently aiming at. Otherwise the routine keeps changing the color of the sprite, giving a pulsing effect.

- 1) Insert your COMAL disk in drive\*.
- 2) Type LOAD "C64 COMAL", 8
- 3) Type RUN (starts COMAL)
- 4) Type AUTO (turn on auto line #'s)
- 5) Enter the program lines shown below.  
Lines are indented by COMAL automatically when you list the program. Ignore leading spaces while typing in the program.
- 6) Hit RETURN key twice when done
- 7) Type RUN

```
0010 setup
0020 repeat
0030 aim
0040 until true=false //forever
0050 //
0060 proc setup
0070 black:=0; white:=1
0080 background black
0090 pencolor white
0100 repeat
0110 input "speed (1-9):": speed
0120 until speed>0 and speed<10
0130 setgraphic 0
0140 hideturtle
0150 define'shape(1)
0160 identify 1,1
0170 spritcolor 1,white
0180 spritesize 1,true,true
0190 xpos:=100; ypos:=100
0200 plottext 1,1,"crsr=move d=draw"
0210 endproc setup
0220 //
0230 proc define'shape(num) closed
0240 dim shape$ of 64
0250 for x:=1 to 64 do
0260 if not eod then read temp
0270 shape$(x):=chr$(temp)
0280 endfor x
0290 data 24,0,0,24,0,0,231,0,0
0300 data 231,0,0,24,0,0,24,0
0310 define num,shape$
0320 endproc define'shape
0330 //
0340 proc aim
0350 spritepos 1,xpos,ypos
0360 case key$ of
0370 when chr$(145) //crsr up
0380 ypos:=+speed
0390 when chr$(17) //crsr down
0400 ypos:=-speed
0410 when chr$(157) //crsr left
0420 xpos:=-speed
0430 when chr$(29) //crsr right
0440 xpos:=+speed
0450 when "d","D" //draw
0460 drawto xpos+8,ypos-5
0470 otherwise
0480 spritcolor 1,rnd(1,15)
0490 endcase
0500 endproc aim
```

\* If you don't have COMAL yet, order a Programmer's Paradise Package-\$19.95. It includes the complete COMAL system plus over 400 pages of information. Add \$5 more to get our 20 interactive lesson Tutorial Disk. Add \$2 shipping. Visa/MC or US funds check accepted. ■

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# The Walker

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by Captain COMAL

There is no need to be frightened of sprites. COMAL adds simple commands to easily control all 8 sprites at once. WALKER is a simple program that animates a sprite using 4 shapes. Try the program. Watch the WALKER hobble across the screen. COMAL is so fast that a pause routine is added to slow the WALKER down.

The whole program is merely 4 lines long. Well, actually more if you count all the procedures too. It takes advantage of COMAL's modular nature, and sets up procedures to perform the several routines needed. The first one is called SETUP. As you might guess it sets up things for the program. Before setting up the sprite colors and size the SETUP procedure, calls DEFINE'IMAGES. Now, that is where the sprite shapes are determined - all four of them.


Sprite images are defined by a 63 byte string, just as in BASIC. But COMAL does all the work. DEFINE puts the images in a special reserved area of memory for you! No PEEK or POKE needed. Then IDENTIFY lets any sprite use any of the defined shapes at any time, even simultaneously. But why use a 64 byte string to DEFINE our shapes? Only 63 are for the shape itself! If the 64th byte is a CHR\$(0) it tells COMAL that the sprite is Hi-Res. Otherwise the sprite will be Multi-Color (like in this program). Lines 150-170 show how easy it is to set up the colors for our sprites, as well as to choose to expand their size.

The rest of the program is a simple REPEAT loop. It continues WALKING until you press the Q key. WALKING keeps moving our sprite across the screen while animating the images. SPRITEPOS in line 430 changes its position while IDENTIFY in line 440 gives it an image. Then line 450 pauses a bit. Change the (99) to something smaller for a shorter pause. Remove the line altogether for some really fast walking.

Finally, notice the use of MOD in lines 420 and 440. It does a division and throws away the answer. The only thing it remembers is the remainder. Thus 9 MOD 4 is 1, the remainder of 9 divided by 4. This is a convenient way to have images cycle by fours.

- 1) Insert your COMAL disk in drive\*.
- 2) Type LOAD "C64 COMAL".8
- 3) Type RUN (starts COMAL)
- 4) Type AUTO  
(COMAL provides the line numbers)
- 5) Enter the program lines shown below  
(COMAL indents lines for you)
- 6) Hit RETURN key twice when done
- 7) Type RUN  
Watch an animated sprite hobble across the screen. Change the (99) in line 450 for really fast walking

```
0010 setup
0020 repeat
0030   walking
0040   until key$="q" //Q to Quit
0050 //
0060 proc setup
0070   blue:=14; pink:=10
0080   white:=1; black:=0
0090   define'images
0100   repeat
0110     input "speed (1-10): ": speed
0120     until speed>=1 and speed<=10
0130     background black
0140     setgraphic 0
0150     spriteback blue,pink
0160     spritcolor 1,white
0170     spritesize 1,false,false
0180     plottext 1,1,"press q to quit"
0190 endproc setup
0200 //
0210 proc define'images closed
0220   dim shape$ of 64, c$ of 1
0230   shape$(1:64):=""
0240   shape$(64):=chr$(1)//multicolor
0250   c$:=chr$(0)
0260   for x=22 to 63 do shape$(x):=c$
0270   c$:=chr$(170)
0280   for x=1 to 21 do shape$(x):=c$
0290   define 0,shape$
0300   c$:=chr$(20)
0310   for x=22 to 42 do shape$(x):=c$
0320   define 1,shape$
0330   define 3,shape$
0340   c$:=chr$(60)
0350   for x=43 to 63 do shape$(x):=c$
0360   define 2,shape$
0370 endproc define'images
0380 //
0390 proc walking
0400   for walk:=1 to 319 div speed do
0410     x:=walk*speed
0420     y:=100+walk mod 4
0430     spritepos 1,x,y
0440     identify 1,walk mod 4
0450     pause(99)
0460   endfor walk
0470 endproc walking
0480 //
0490 proc pause(delay) closed
0500   for wait:=1 to delay do null
0510 endproc pause
```

\* If you don't have COMAL yet, order a Programmer's Paradise Package-\$19.95. It includes the complete COMAL system plus over 400 pages of information. Add \$5 more to get our 20 interactive lesson Tutorial Disk. Add \$2 shipping. Visa/MC or US funds check accepted. 

---

# Backup Your Disks

---

Don't use the disks we send you! As a matter of fact, don't use the disks that any company sends you. First, backup the disk. Then store the original disk in a safe place. Finally, use the copy of the disk. "Why bother?" you may ask. Well, if for any reason the disk is ruined, simply get out the original disk and make yourself another copy.

OK, there are more reasons to make those copies. One is compatibility. There are at least three variations on the popular Commodore disk format: 1541, 4040 and MSD. They each can read the other format types, thus they are READ compatible. However, they are NOT WRITE compatible. If you use a 1541 drive to write on a disk that was created with a 4040 drive you are asking for trouble. Problems will not arise right away. But one day - ZAP. You will have missing files! Avoid the heartache.

Many of our disks now come with programs on BOTH sides. Since we only use premium disks specifically designed for this, it shouldn't present a problem. However, using the disk constantly from side to side is not recommended. Copy both sides of these disks onto two new disks.

A final reason for copying the disks is that of disk drive head alignment. Your drive may be just slightly misaligned. That will not cause problems as long as you use disks written by your own drive.

How do you make a backup copy of our disk? If you are one of the lucky ones with an MSD Dual Drive it is easy. Just place the original disk into drive 0 (on the left) and a blank disk into drive 1 (on the right). Then issue this command from COMAL:

PASS "D1=0"

If you have only a single drive, you still can backup our disks. Since our disks are NOT copy protected, any disk backup program will work. Use the backup program you already have. If you do not have a disk backup program, we are providing one for you on the *Programmers Paradise Disk*. Since maximum memory is needed to backup a disk, the program supplied is a BASIC program. Do not try to load it into COMAL. Do this:

- 1) Remove any disk from your drive.
- 2) Turn off the computer system.
- 3) Turn on the computer system.
- 4) Insert the *Programmers Paradise Disk* into your drive. Using unshifted letters type in this command followed by the RETURN key:  
load "backupdisk.basic",8
- 5) Type this line followed by RETURN:  
run
- 6) The screen clears and you are asked:  
disk name ?
- 7) Before replying, remove the original disk from the drive. Insert a blank disk. The program erases and formats the disk for use as your backup.
- 8) Type in a name for the disk (up to 16 characters).
- 9) Next you are asked:  
unique disk id ?

Every disk has its own two character ID. No disks should ever have the same disk ID. It is hard to emphasize this enough. The *Captain COMAL Gets Organized* disk management system will help you keep

More ►

track of your disk ID's (even print a chart of those you have already used). For now, type in two characters that you are SURE are not yet used in your disk library. Try [] since it is unusual.

- 10) Instructions appear on the screen:  
insert source disk, press SPACE
- 11) Remove the new disk from the drive.  
Label it with the disk name and ID.  
Insert the original disk, called the  
source disk. Then hit the SPACE bar
- 12) Ignore information about the disk  
that scrolls by. It ends by  
estimating about how long the copy  
may take. Then it counts and reads  
blocks from the source disk. The  
count is flashed on the bottom  
screen line:  
reading block #---
- 13) After 124 blocks are read, more  
instructions appear on the screen:  
insert destination disk, press SPACE
- 14) Take out the original source disk.  
Put the new destination disk into  
the drive. Then hit the SPACE bar.
- 15) As blocks are written to the disk,  
the count is shown:  
writing buffer #---
- 16) After all the blocks are written you  
will see the message:  
insert source disk, press SPACE
- 17) Remove the new destination disk. Put  
the original source disk back into  
the drive. Then hit the SPACE bar.
- 18) Now the familiar message appears  
again, flashing through the next set  
of blocks, 1 through 124 (yes, the

- 19) After the next 124 blocks are read you'll see the message:  
insert destination disk, press SPACE
- 20) You now may go back to step 14 and continue the cycle of swapping disks back and forth as instructed by the program. BE PATIENT! It may take up to 12 disk swaps. The last pass of reading blocks from the original source disk will probably stop before it gets to 124. That is your sign that this is the final swap. Put in the destination disk as instructed. After it writes the final blocks it lists the directory of the newly created disk. ■

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**COMAL STARTERS KIT**  
as rated by The Book of Commodore 64 Software 1985.

|                       |            |                        |
|-----------------------|------------|------------------------|
| <b>Overall Rating</b> | <b>A A</b> | <b>Reliability</b>     |
| <b>Ease of Use</b>    | <b>A A</b> | <b>Error Handling</b>  |
| <b>Documentation</b>  | <b>A A</b> | <b>Value for Money</b> |

**Published by Arrage, Inc., The Book Division**

**COMAL Starters Kit is now called Programmers Paradise.** 

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# Copy Files

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There are many times when you may wish to copy just a couple files from one disk onto another. To help you with this task, we provided a program, *SINGLE FILE COPY*, on *TODAY DISK #1 and #2*. It is a very nice program, but could not copy a large program file like *C64 COMAL 0.14*. So, we have now provided another single file copy program. It is not as friendly as the first one, but this one will copy up to 40K files (up to about 160 blocks on a disk). Thus, it will copy the *C64 COMAL 0.14* file (131 blocks). This new program, called *COPYFILES.BASIC*, is on the *Programmers Paradise Disk*. Maximum memory was needed for copying a large file, so the program was written in BASIC. Do not load it into COMAL. Here is how to use it:

- 1) Turn computer system on.
- 2) Insert *Programmers Paradise Disk* into drive.
- 3) Enter these commands:  
    load "copyfiles.basic",8  
    run
- 4) The screen will clear and the program will ask:  
    Please enter filename with  
    ,s for SEQ or ,p for PRG  
    after the name:
- 5) Remove the disk from the drive.
- 6) Insert the disk with the file you wish to copy on it into the drive.
- 7) Type in the exact name of the file you wish to copy. If it is a program file, PRG in the disk catalog, add a ,p after its name. For example:  
    c64 comal 0.14,p

If it is a sequential file, SEQ in the disk catalog, add a ,s after its name. For example:  
    comalerrors,s

- 8) The program will initialize the disk and will read in all the of the file you specified. This message will appear on the screen:  
    Reading file...
- 9) If it encounters a disk error it will stop and print:  
    Disk problem!

If the file is too big (over 40K) it will stop and print:  
    File too large!

If all is OK it will prompt you to switch disks:  
    Insert disk to write file to  
    and press RETURN

- 10) If all was OK, take out the original disk and insert the disk you wish to write the file to. Then hit the RETURN key.
- 11) While the file is copied onto the new disk this message is displayed on your screen:  
    Writing file...
- 12) When the file is completely copied, the program ends with this message:  
    All done.
- 13) If you wish to copy another file, enter the command: run and continue at step number 4.

See page 7 for instructions on how you can use this program to make your own COMAL start up disk. ■

# Double Sided Disks

"Will a double sided diskette, such as a COMAL TODAY Disk, work in the Commodore 1541 disk drive?" We've received cards and letters from several new COMALites around the country who weren't too sure.

We now distribute disks with programs stored on BOTH sides. While this method is greeted with joy by most, some wonder how the single sided 1541 disk drive can read a double sided diskette.

The 1541 can read a double sided disk only with a bit of help. You must provide the help by flipping the diskette over. Here's how it works.

For example, *TODAY DISK #9* has COMAL 0.14 programs stored on the front side. To use the programs, simply insert the diskette the usual way, with the label up, and follow the loading instructions.

The tricky part comes when COMAL 2.0 cartridge owners want to use the 2.0 programs that are stored on the back side of the diskette. The 1541 drive has only one read/write head, not two. You must take the diskette out of the drive and flip it over. Then insert it in the drive with the label down.

After you've done this, the 1541's read/write head can read the back side of the diskette. The 2.0 programs can then be loaded normally.

By recording programs on both sides of the disk you get two disks of programs on one disk. We use only special disks manufactured specifically to be used on both sides by flipping the disk over.

We expect you to copy the programs on both sides to two other disks, and then file away the original disk as a Master.

That is what you should do with all disks you receive from us (and other software distributors). The disk you receive is considered your MASTER DISK. Never use a master disk. Use only copies of it. Then if anything happens to the disk, you need only make another copy. This is especially true with Commodore format disks, since the 1541, 4040 and MSD drives are read compatible - but NOT write compatible. Our master disks are usually created on a 4040 drive and are not copy protected.

Master disks should never, never be written on. To insure that you don't accidentally write on one of your Masters, many of the disks we distribute have no write protect notch. That makes them **READ ONLY** disks. ■

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## THAT'S WHAT THEY SAID...

If languages interest you, this one is well worth a look... It's inexpensive to try. You may find that it's just what you have been looking for.

- Jim Butterfield, Compute!

COMAL was just what I was looking for.

- Colin Thompson, RUN

Overall COMAL averages out to about 3 times faster than BASIC.

- Loren Wright, Micro

**This disk is fantastic!**

- Tom Lynch, The Users Port

**I don't have enough space to list all the good points!**

- Noland Brown, Midnite Software Gazette

I can recommend a better, faster, and cheaper programming language. It's a flashy little European import called COMAL... the most user-friendly language around.

- Mark Brown, Info

**Combines some of the best features of languages like Logo, Modula, Pascal, and Ada in an easy-to-use format.**

- Ahoy

**Everybody who gets it, likes it!**

- Len Lindsay



\* Subscribers are welcome to send us a letter with questions about COMAL. If you wish a reply you must include a self addressed stamped envelope.

\* We now have a wide selection of books and disks. *COMAL TODAY* #7 presents reviews of the books. Disks are discussed in each issue of *COMAL TODAY*.

\* Subscribers get a discount! Not only is a subscription to *COMAL TODAY* going to help you with information, tips and program listings; as a subscriber you get a discount on nearly every item we offer (the order form has two prices; subscribers get the lower price).

\* Remember to add on the shipping cost as noted on the order form. Shipping to Canada and APO addresses is more expensive, since we can't use UPS. Overseas shipping is very expensive!

\* All orders must be prepaid (no COD). VISA and MasterCard are accepted and provide the fastest processing. Money Orders also allow quick service (a Canadian Postal Money Order in US Dollars is fine). Checks (in US Dollars drawn on a US bank) are accepted, but shipment may be delayed for 2 weeks while the check clears the banks.

Exception for schools only: we will accept a Purchase Order only if we are guaranteed payment within 30 days of our shipping date and that we do not have to fill out any special forms. We supply several copies of our invoice to the school under separate cover as our request for payment.

\* Foreign orders are accepted, but not solicited. They require special handling which means an extra delay. Also the shipping costs are very high.

\* We cannot ship COMAL 2.0 Cartridges outside of North America and we cannot ship COMAL 0.14 to Denmark or Sweden.

#### HOW TO PLACE AN ORDER

Use the order form provided to order by mail. Or, Monday thru Friday, 8:30 am until 4 pm you may call (608) 222-4432 to order by phone (VISA or MasterCard ONLY). IMPORTANT: we need a street address for delivery (no PO boxes).

\* Allow us 2 weeks to process and ship your order (time will often be less - but sometimes more). Add to that a reasonable amount of time for it to be delivered (as well as time for your order to get to us if you mail it). ■

\*\*\*\*\* Shipments may include 2 disks of programs as one double sided disk \*\*\*\*\*

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